



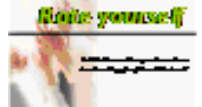
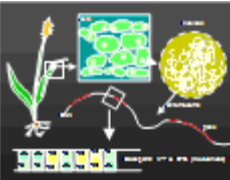
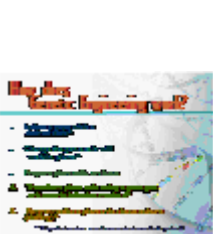
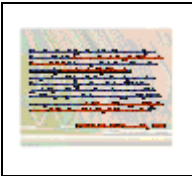
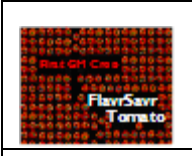


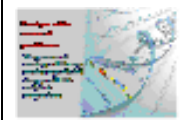
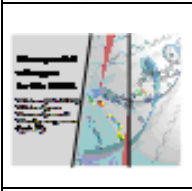

	<p>This presentation is based on information contained in the book <i>Genetic Roulette: The Documented Health Risks of Genetically Engineered Foods and Seeds of Deception</i>, both by Jeffrey Smith. Full citations for the studies presented are found in <i>Genetic Roulette</i>.</p>
	<p>What is genetically engineered in the US? Right now soy, corn, cotton, and canola are the big four. Soy and Corn derivatives are in most processed foods. If it comes in a box from the supermarket, it is probably genetically engineered. All four are used in vegetable oil.</p>
	<p>Most Hawaiian papaya is genetically engineered, and so is a small amount of zucchini and crookneck squash. Roundup Ready Alfalfa was introduced in 2005, but is no longer sold. Quest brand tobacco is also genetically engineered. The US sugar beet growers plan to introduce GM sugar by the end of 2009 as well.</p>
	<p>In order to avoid eating GMOs, you must: 1. Buy organic, which is not allowed to use GM inputs 2. Buy products that are labeled Non-GMO 3. Buy products listed on a Non-GMO Shopping Guide, or 4. Read labels and avoid the at risk ingredients, such as soy protein isolate, lecithin, high fructose corn syrup, dextrose, maltodextrin, and all corn derivatives, canola and cottonseed oil, etc.</p>
<p>Visit www.ResponsibleTechnology.org to find more information on how to avoid GM foods, as well as a shopping guide.</p>	
	<p>Let's evaluate our current approach to GM foods. Rate yourself 1-100 as to how vigilant were you at avoiding GM foods when eating out? Most people are between 1-20 How many people are between 1-20, 20-40, 40-60, 60-80, 80-100? Rate yourself 1-100 as to how vigilant you have been this week in avoiding bringing GM foods into your home? How many people are between 1-20, 20-40, 40-60, 60-80, 80-100?</p>
	<p>How active have you been at spreading the word or working on this issue? 1-20, 20-40, 40-60, 60-80, 80-100? This is the pre-test. I will ask again at the end of the presentation.</p>
	<p>To understand what Genetically Modified Organisms or GMOs are, let's first review what DNA is. Within the tissues of the plant are cells. Within the cell is the nucleus. Within that are chromosomes composed of the DNA molecule, which in turn is made up of a sequence of base pairs. A simplistic description is that sequence of the genes in the DNA determine the sequence in the RNA, which then determines the sequence of the building blocks of proteins, called amino acids. These proteins can determine a particular trait or characteristic.</p>
	<p>Using genetic engineering, scientists take genes from bacteria, viruses or other sources and force them into the DNA of a plant. There are 5 steps. First they isolate the gene that they want to insert and then change it so that it works in plants. They prepare plant cells to be inserted. Insertion is often done using a gene gun, where they coat tiny particles of gold or tungsten with genes and then shoot them into a plate of cells. Alternatively, they can use bacteria to infect plants with the foreign gene. Once the gene gets into the DNA of the plant cell, the cell is cloned (using tissue culture) into a full plant. All but one of these steps contain scientific uncertainties and risks for health and the environment.</p>


	<p>Here is a diagram representing the gene that is inserted. It is called a transgene or gene construct. Let's say scientists want to create a corn plant that produces its own pesticide. They typically take a gene from bacteria that produces its own pesticide. The bacteria are called Bt for <i>Bacillus Thuringiensis</i> and the pesticidal toxin it creates is called Bt-toxin. If you take the pesticide-producing Bt gene from the bacterium and</p>
	<p>put that inside corn by itself it wouldn't work. Plant DNA is normally designed to turn genes on and off as needed by the cell. But there is no corn on earth that has ever had this BT gene before the advent of genetic engineering. The corn plant does not know how to turn it on. So scientists attach a promoter, usually taken from a virus, which acts as an "on" switch. It turns the gene on 24/7. This BT gene is not under the control of the DNA. It is under the control of this inserted viral promoter. On the other side of the gene, scientists attach a stop signal or termination signal, which tells the cell, "The gene ends here. Stop reading." Scientists make millions of copies of the transgene, which are either shot into millions of cells or infected into the cell by bacteria. The hope is that some of the genes make it into the DNA of some of those cells. They can't tell which of the genes make it into the DNA. So, they do the following: Before they multiply and insert the gene construct, they add an antibiotic resistant marker gene. This new gene creates a protein that protects the cell from a specific antibiotic.</p>
	<p>Next, they dowsed that plate of cells with antibiotics. It kills off most of the cells except the very few where the transgene made it into the DNA—where the antibiotic resistant gene is functioning. Thus, the surviving cells are antibiotic resistant.</p>
	<p>The surviving cells are cloned into GM plants. Each cell of each plant now contains the gene that produces the Bt-toxin. It also contains the antibiotic resistant gene, which is now in our food. FDA scientists who evaluated the use of the antibiotic resistant gene were appalled with the idea.</p>
	<p>Documents made public from a lawsuit revealed that the FDA division of anti-infective drugs wrote in all capital letters, "IT WOULD BE A SERIOUS HEALTH HAZARD TO INTRODUCE A GENE THAT CODES FOR ANTIBIOTIC RESISTANCE INTO THE NORMAL FLORA OF THE GENERAL POPULATION." They were concerned that the antibiotic resistant marker gene might transfer to disease-creating</p>
	<p>bacteria in the gut or in soil, rendering the bacteria invincible to antibiotics. There are already antibiotic resistant super-diseases due to the overuse of antibiotics, but the FDA scientists were concerned that this use in GM foods could make the problem much worse. This wasn't the only concern among the FDA scientists. [For source documents with FDA quotes, go to www.biointegrity.org.]</p>
	<p>The overwhelming consensus among the agency's own scientists was that GM foods could lead to unexpected, hard to detect side effects, including allergens, toxins, new diseases, and nutritional problems. The scientists urged their superiors to require long-term safety studies.</p>
	<p>The FDA Toxicology Group wrote that GM plants could "contain unexpected high concentrations of plant toxicants." "The possibility of unexpected, accidental changes in genetically engineered plants justifies a limited traditional toxicological study."</p>
	<p>The Division of Food Chemistry and Technology described the types of problems, including: "Increased levels of known naturally occurring toxins", "Appearance of new, not previously identified" toxins, Increased tendency to gather "toxic substances from the environment" such as "pesticides or heavy metals", and "Undesirable alterations in the levels of nutrients." They recommended testing every GM food "before it enters the marketplace."</p>


	<p>The Center for Veterinary Medicine (CVM) was worried that meat and milk from animals fed GM feed might be toxic. Other experts and departments described concerns for allergens, which may be impossible to identify before a GM food is released into the market. With all these concerns, here is what the official policy of the FDA states.</p>
	<p>“The agency is not aware of any information showing that foods derived by these new methods differ from other foods in any meaningful or uniform way.” This sentence in the 1992 FDA policy, which still stands today, is the reason why GM crops are on the market. On the basis of this statement, the FDA said no safety testing was necessary. If Monsanto or the other biotech food companies say their foods are safe, the FDA has no further questions.</p>
	<p>The quotes already presented were from private FDA documents written before this policy statement was made public. The specific concerns about allergies, toxins, etc. demonstrate that this sentence was a lie. Other documents further contradict the stated policy that there was no difference between GM and non-GM foods.</p>
	<p>An FDA compliance officer, summarizing all the memos from the various individuals and divisions at the agency, wrote: “The processes of genetic engineering and traditional breeding are different, and according to the technical experts in the agency, they lead to different risks.”</p>
	<p>She continued: By “trying to force an ultimate conclusion that there is no difference between foods modified by genetic engineering and foods modified by traditional breeding practices,” the agency was “trying to fit a square peg into a round hole.”</p>
	<p>One division director not only said there were “unique animal and food safety concerns” from GM plants, but, in an apparent protest against the proposed wording of the FDA policy, he said, “I would urge you to eliminate statements that suggest that the lack of information can be used as evidence for no regulatory concern.” He was ignored.</p>
	<p>FDA microbiologist Louis Pribyl wrote: “There is a profound difference between the types of unexpected effects from traditional breeding and genetic engineering,” “There is no certainty that [breeders] will be able to pick up effects that might not be obvious.”</p>
<p>“This is the industry’s pet idea, namely that there are no unintended effects that will raise the FDA’s level of concern. But time and time again, there is no data to back up their contention.” In spite of the scientists’ memos, each subsequent draft of the FDA policy removed more and more of their concerns.</p>	
	<p>When reviewing the changes made in the GMO policy drafts, Pribyl wrote: “What has happened to the scientific elements of this document? Without a sound scientific base to rest on, this becomes a broad, general, “What do I have to do to avoid trouble”-type document. . . . It will look like and probably be just a political document. . . . It reads very pro-industry, especially in the area of unintended effects.”</p>
	<p>Who overruled the scientists? The man in charge of FDA policy, Michael Taylor. He was Monsanto’s former attorney, and later their vice-president. The White House under George H. W. Bush had instructed the FDA to promote the biotechnology industry, and so the FDA created a new position for Michael Taylor. As a result of the policy that he</p>
<p>oversaw, if Monsanto and others want to put a GM crop on the market, they don’t even have to tell the FDA. GM companies do participate in a voluntary and highly superficial consultation process with the FDA, in which they offer just summary data and their own conclusions of safety.</p>	


	<p>At the end of the meaningless exercise, the FDA provides a letter confirming that the biotech company, such as Monsanto, “has concluded that its GM products are safe.”</p> <p>The Environmental Protection Agency (EPA) does have a few superficial safety requirements, but only for pesticide-producing GM crops.</p>
	<p>The first GM crop was looked at by the FDA was the FlavrSavr tomato, engineered to have a longer shelf-life. Calgene, its producers, were the only company to give the FDA raw feeding study data. They did a study with rats but ...</p>
	<p>...the rats refused to eat the tomato.</p> <p>Farmers, students, reporters and scientists from across America, reported that when given a choice, a large variety of animals avoid eating GM foods. These include cows, pigs, geese, squirrels, elk, deer, raccoons, mice and rats.</p>
	<p>They force fed rats the FlavrSavr tomato for 28 days. 7 of 20 rats developed stomach lesions. Another 7 of 40 died within 2 weeks. In the documents made public, scientists said that the study doesn't show “a reasonable certainty of no harm.” The FDA did not block the introduction of the tomato. (continued below)</p>
<p>The company had created two lines of the GM tomato, both with the same gene inserted. One was associated with these high rates of lesions and deaths, the other was not. The company voluntarily decided to market the one that was not associated with the rat problems.</p> <p>This also provides an example of how the same crop inserted with identical genes, may have very different results. And it provides a good example of the first category of what can go wrong with GMOs.</p> <p>[Department of Veterinary Medicine, FDA, correspondence June 16, 1993. As quoted in Fred A. Hines, Memo to Dr. Linda Kahl. “Flavr Savr Tomato: . . . Pathology Branch’s Evaluation of Rats with Stomach Lesions From Three Four-Week Oral (Gavage) Toxicity Studies . . . and an Expert Panel’s Report,” Alliance for Bio-Integrity (June 16, 1993) http://www.biointegrity.org/FDAdocs/17/view1.html; and also Arpad Pusztai, “Can Science Give Us the Tools for Recognizing Possible Health Risks for GM Food?” <i>Nutrition and Health</i> 16 (2002): 73–84.]</p>	
	<p>We will look at five possible causes for health problems related to GM foods. The first is that process of creating a GM crop may create unpredicted changes.</p>
	<p>The process of inserting a transgene causes mutations, or changes in the sequence of the genetic code, near the insertion site and elsewhere. Inserting the transgene can delete natural native genes. In one study, 13 genes were deleted by a single insertion. Sometimes, the transgene will be imbedded in the middle of a native gene, changing its function. Native genes can be switched off permanently, or even turned on permanently.</p>
<p>The biotech industry claimed the promoter they insert would only turn on the transgene. That is not true. The promoter can actually turn on other genes downstream from the transgene--permanently. This many cause it to overproduce its protein in high volume, which might be an allergen, toxin, carcinogen, or anti-nutrient.</p> <p>The process of cloning a cell into a plant can create hundreds or thousands of additional mutations up and down the DNA. According to two studies, the GM DNA is 2-4% different than the DNA of its parent. Most of the changes are unpredicted mutations.</p> <p>In addition, inserting a single gene can change how much protein is being produced in hundreds or thousands of genes. Scientists tested the process of inserting a single gene into a human cell and found that up to 5 percent of the genes changed their levels of expression.</p> <p>Taken together, genetic engineering causes massive collateral damage in the DNA. Biotech industry scientists and regulators, on the other hand, operate as if genes were like Legos that cleanly snap in place, and operate independently of the other genes in the DNA. (citation below)</p>	

[Allison Wilson, PhD, Jonathan Latham, PhD, and Ricarda Steinbrecher, PhD, "Genome Scrambling—Myth or Reality? Transformation-Induced Mutations in Transgenic Crop Plants Technical Report—October 2004, <http://www.econexus.info>; see also J. R. Latham, et al., "The Mutational Consequences of Plant Transformation," The Journal of Biomedicine and Biotechnology 2006, Article ID 25376: 1–7.]

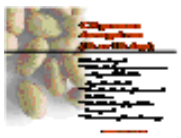
 On July 1, 2007, the New York Times wrote, "The presumption that genes operate independently has been institutionalized. . . . It is the economic and regulatory foundation on which the entire biotechnology industry is built." Evidence of a networked genome shatters the scientific basis for virtually every official risk assessment of today's commercial biotech products. Yet to date, every attempt to challenge safety claims for biotech products has been categorically dismissed, or derided as unscientific.


 DNA creates RNA, and the RNA creates proteins. Proteins interact and create all the hundreds or thousands of natural products that make plants unique. Each element in this process might be altered as a result of the unpredicted changes in the DNA.

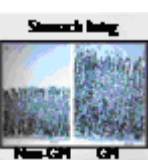
 An example of unpredicted side-effects due to the process of genetic engineering was accidentally discovered in a UK government-funded study. The government was seeking to create the ideal safety testing protocol for GM crops, which was to be eventually implemented into the EU approval process. Twenty-eight scientists applied for the \$3 million grant, which was ultimately awarded to

 This man, Dr. Arpad Pusztai, the world's leading expert in his field, working at a top nutritional research institute in the UK. Part of their research included creating a GM potato that produced its own insecticide. They fed the GM potato to the rats. They also fed another group of rats a potato spiked with the same pesticide that the GM potato was engineered to

produce, and the third group got regular potatoes. They even varied it so that different rats ate baked, raw, or boiled potatoes. And all groups received a balanced diet. The group that ate the GM potatoes was seriously damaged. The potato spiked with the insecticides did not show problems. What then was the cause for the health damage? It was not the insecticide. It is most likely the process of genetic engineering.

 The rats developed potentially precancerous cell growth in the digestive tract, smaller brains, livers and testicles, partial atrophy of the liver and damaged immune systems. [Arpad Pusztai, "Can science give us the tools for recognizing possible health risks of GM food," Nutrition and Health, 2002, Vol 16 Pp 73-84; and Stanley W. B. Ewen and Arpad Pusztai, "Effect of diets containing genetically modified potatoes expressing Galanthus nivalis lectin on rat small intestine," Lancet, 1999 Oct 16; 354 (9187): 1353-4.]


 The picture on the left is the intestinal wall of a rat who was fed non-GMO potato. Picture on right is from a rat who was fed GM-potato.


 The picture on the left is the stomach wall of a rat who was fed non-GMO potato. On the right is the stomach wall of a rat who was fed the GM-potato. With permission from his institute director, Dr. Arpad Pusztai was interviewed on national TV and expressed concerns about GM food safety. He was a hero for about


2 days at his prestigious institute. Then, two phone calls were allegedly placed from the UK Prime Minister's office, forwarded through the receptionist, to the director. The next day, Dr. Pusztai was fired from his job after 35 years and silenced with threats of a lawsuit. His 20 member research team was disbanded, and the data was kept hidden. The institute put out a number of statements designed to damage the reputation of Dr. Pusztai and to support GMOs. The safety testing protocols his team was working on were never implemented.


Eventually he was invited to speak before parliament about his work, which lifted the gag order and

allowed him to access his data. The study was eventually published in *The Lancet*. It is arguably the most in-depth animal feeding study ever published on GM foods. It shows that the process itself might be inherently dangerous. It is noteworthy that the same process used to create Dr. Pusztai's potatoes were used to create the GM crops on the market. But we don't know if those products cause the same damage in our guts as they do in rats, since no studies have been conducted on the commercialized GM foods that adequately tests for the problems that Dr. Pusztai found.

	<p>The second cause of problems is the intended protein, produced by the inserted gene, may be harmful.</p>
---	---

	<p>There are two primary traits engineered into GM soy, corn, cotton, and canola. They are herbicide tolerance and pesticide production. With herbicide tolerance, the GM crops are inserted with a gene that allows them to survive applications of a particular herbicide. This is a great marketing opportunity for the manufacturers who sell the seeds and the herbicide as a package deal. For example, Monsanto sells Roundup Ready crops, which are engineered to survive applications of the company's Roundup herbicide. Buyers even sign a contract with Monsanto saying they will only use Monsanto's brand of herbicide with their GM crop.</p>
---	--




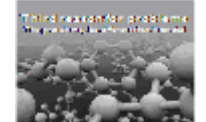
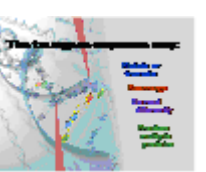
	<p>Let us take a look at the other of these traits – the Bt pesticide. As mentioned, there is a gene from soil bacteria that creates a poison, which kills specific insects. In its natural form, it is used in organic and conventional agriculture and forestry. Scientists take the bacterial gene, make changes so it will work in plants, and the put it into plant DNA. Now every cell of the plant creates the toxin. The reason why it is allowed in our food is because of the assumption that it has a history of safe use. They further assume that the protein is destroyed during digestion and that it wouldn't interact with mammals or humans in any case. Mammals and humans do not even have receptor cells so they claim it would just pass right through the system if not digested.</p>
---	--

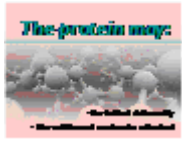
	<p>It turns out that these assumptions are not true. In reality people do react to Bt spray. In fact, the label on the Bt spray bottle warns people not to consume it. Several studies show reactions among farmers, including antibody responses to Bt in the blood. More importantly, when they did an aerial BT spray for Gypsy Moth infestation in the Pacific Northwest, about 500 people reported allergic type reactions and some had to be hospitalized.</p>
---	--

Bt toxin also survives digestion. If you feed it to mice, the lower part of their small intestines can become damaged. There were fragments of cells, damaged cells, and potentially pre cancerous growth. Further, mice developed an immune response as if they had been fed Cholera toxin. They also develop an adjuvant response. This means they are sensitized to other compounds that they never reacted to before, as in the case of the condition called multiple chemical sensitivity.

[See for example: Washington State Department of Health, "Report of health surveillance activities: Asian gypsy moth control program," (Olympia, WA: Washington State Dept. of Health, 1993); M. Green, et al., "Public health implications of the microbial pesticide *Bacillus thuringiensis*: An epidemiological study, Oregon, 1985-86," *Amer. J. Public Health* 80, no. 7(1990): 848–852; M.A. Noble, P.D. Riben, and G. J. Cook, "Microbiological and epidemiological surveillance program to monitor the health effects of Foray 48B BTK spray" (Vancouver, B.C.: Ministry of Forests, Province of British Columbia, Sep. 30, 1992); I.L. Bernstein et al, "Immune responses in farm workers after exposure to *Bacillus thuringiensis* pesticides," *Environmental Health Perspectives* 107, no. 7(1999): 575–582; Nagui H. Fares, Adel K. El-Sayed, "Fine Structural Changes in the Ileum of Mice Fed on En-dotoxin Treated Potatoes and Transgenic Potatoes," *Natural Toxins* 6, no. 6 (1998): 219–233; Vazquez et al, "Intragastric and intraperitoneal administration of Cry1Ac protoxin from *Bacillus thuringiensis* induces systemic and mucosal antibody responses in mice," 1897–1912; Vazquez et al, "Characterization of the mucosal and systemic immune response induced by Cry1Ac protein from *Bacillus thuringiensis* HD 73 in mice," *Brazilian Journal of Medical and Biological Research* 33 (2000): 147–155; and Vazquez et al, "Bacillus thuringiensis Cry1Ac protoxin is a potent systemic and mucosal adjuvant," *Scandinavian Journal of Immunology* 49 (1999): 578–584. See also Vazquez-Padron et al., 147 (2000b).]

 <p>Bt in crops Thousands of laborers in India reported health problems after handling the pesticide. In cotton</p>	<p>The Bt in crops is probably far more dangerous than the spray. The spray biodegrades or can be washed off. In the GM crops, it is produced inside every cell and cannot be washed off or degraded. In fact it is produced in concentrations that can be three to five thousand times more than in spray form. Also, the natural BT pesticide molecule has a safety catch on it, keeping it inactive.</p>
<p>Once it gets inside an alkaline stomach of an insect, the safety catch is removed and it then the Bt destroys the stomach lining of the pest and kills it. When scientists prepare the Bt gene for plants, however, they change it so the molecule no longer has the safety catch. It is immediately active. This is also a form that is likely to be more toxic to humans.</p> <p>Further, the amino structure of the Bt toxin has a section that is identical to a known allergen. (It fails the allergy tests recommended by the World Health Organization.)</p> <p>[See for example: Gendel, "The use of amino acid sequence alignments to assess potential allergenicity of proteins used in genetically modified foods," <i>Advances in Food and Nutrition Research</i> 42 (1998), 45–62.]</p>	
 <p>Bt cotton Thousands of laborers in India reported health problems after handling the pesticide. In cotton</p>	<p>In India, hundreds of laborers picking cotton and working in cotton ginning factories developed allergic reactions when handling the BT cotton. This didn't happen with the non-Bt varieties. There are many laborers who don't go to work unless they've first taken an antihistamine.</p> <p>[Ashish Gupta et. al., "Impact of Bt Cotton on Farmers' Health (in Barwani and Dhar District of Madhya Pradesh)," <i>Investigation Report</i>, Oct–Dec 2005; plus numerous press reports]</p>
	<p>The allergic symptoms from the Bt cotton are identical with those of the hundreds of people who were sprayed with Bt in the Pacific Northwest. Only "exacerbations of asthma" was in one symptom list and not the other.</p>
 <p>Bt cotton Thousands of laborers in India reported health problems after handling the pesticide. In cotton</p>	<p>After the Bt cotton is harvested, shepherds take their flocks into the area to graze on the Bt plants. Within 5 to 7 days, one out of four sheep died. It is estimated that 10,000 sheep died in one region in 2006. Medical investigators found black patches in the intestine, liver, and bile ducts. The shepherds reported that there was nasal discharge, sense of dullness, depression, diarrhea, and coughing among the sheep.</p>
<p>Animals continue to die in subsequent years after grazing in Bt cotton fields. Some regions also report allergic type itching reactions among livestock.</p> <p>[“Mortality in Sheep Flocks after Grazing on Bt Cotton Fields—Warangal District, Andhra Pradesh” <i>Report of the Preliminary Assessment</i>, April 2006, http://www.gmwatch.org/archive2.asp?arcid=6494]</p>	
 <p>Bt cotton Thousands of laborers in India reported health problems after handling the pesticide. In cotton</p>	<p>The government of Andhra Pradesh in India is now warning farmers not to allow their animals to graze on Bt cotton fields.</p>
 <p>Bt corn, reports</p>	<p>A German farmer says that a variety of Bt corn caused 12 of his cows to die, and others to fall sick. The corn producer, Syngenta, reimbursed the farmer for part of his losses but did not admit fault.</p>
<p>[Henning Strodthoff and Christoph Then, "Is GM maize responsible for deaths of cows in Hesse?," Greenpeace Report, Greenpeace e.V. 22745 Hamburg. December 2003; and Mae-Wan Ho and Sam Burcher, "Cows Ate GM Maize & Died," ISIS Press Release, January 13, 2004, http://www.isis.org.uk/CAGMMAD.php]</p>	
 <p>Bt corn, reports</p>	<p>About 25 farmers in the Midwest claim that their pigs and cows became sterile when they were feeding them certain varieties of BT corn. Some pigs developed false pregnancies and gave birth to bags of water. On one farm, the corn that apparently caused the pigs to become sterile was later fed to the cows, and they too became sterile. The reports of animal sterility were not followed up with tests by authorities, just denial that the problem was feed related. [Numerous news reports and first hand accounts]</p>

	<p>In the Philippines, villagers living adjacent to a Bt corn field developed serious health problems while the corn was pollinating. Over days, symptoms spread from those closest to the field to those further away. There were skin reactions, intestinal reactions, and fever. A man who went into the field to investigate had a particularly serious reaction. He whole face swelled up, and he had trouble breathing.</p> <p>The next year the same BT corn was planted in four other villages, and the mysterious disease reoccurred in each, only during the time of pollination.</p>
	<p>[“Study Result Not Final, Proof Bt Corn Harmful to Farmers,” BusinessWorld, 02 Mar 2004; “Genetically Modified Crops and Illness Linked,” Manila Bulletin, 04 Mar 2004; Mae-Wan Ho, “GM Ban Long Overdue, Dozens Ill & Five Deaths in the Philippines,” ISIS Press Release, June 2, 2006; Allen V. Estabillo, “Farmer’s Group Urges Ban on Planting Bt Corn; Says It Could Be Cause of Illnesses,” Mindanews, October 19, 2004; and Jeffrey M. Smith, “Bt-maize (corn) during pollination, may trigger disease in people living near the cornfield,” Press Release, February 2004, http://www.seedsofdeception.com/Public/AboutGeneticallyModifiedFoods/InhaledGMMaizePollenMayCauseDiseas/index.cfm]</p>
	<p>The Bt corn pollen symptoms are not identical to the others related to Bt. In addition to some of the same problems, the Filipinos had headaches, stomach aches, dizziness, diarrhea, vomiting, weakness and numbness. In addition, 9 horses, 4 water buffalos, and 37 chickens died after eating the corn. There were also 5 unexplained human deaths.</p>
	<p>In a study by Monsanto made public because of a lawsuit, rats fed Bt corn developed signs of liver and kidney toxicity. These included kidney inflammation and kidney lesions, and decreased kidney weight. The latter symptom is typically related to blood pressure problems. They also developed increased basophiles which are related to allergies. Increased lymphocytes or white blood cells which are part of the immune</p>
	<p>system indicating a reaction to infection or possibly disease. A 10% increase in blood sugar, and decreased immature red blood cells by 50%. This might indicate anemia.</p> <p>[John M. Burns, “13-Week Dietary Subchronic Comparison Study with MON 863 Corn in Rats Preceded by a 1-Week Baseline Food Consumption Determination with PMI Certified Rodent Diet #5002,” December 17, 2002 http://www.monsanto.com/monsanto/content/sci_tech/prod_safety/fullratstudy.pdf; and Seralini G.E., Cellier D., Spiroux de Vendomois J., “New analysis of a rat feeding study with a genetically modified maize reveals signs of hepatorenal toxicity” by (2007) Arch. Environ. Contam. Toxicol. 52, 596-602.]</p>
	<p>The third cause of problems may be that the protein created by the inserted gene may be different than intended.</p>
	<p>The specific sequence of the inserted gene dictates the sequence of the amino acids of the protein it produces. If the sequence changes, so can the protein. The inserted gene can mutate or truncate during the insertion process. One popular corn variety called Mon 810, for example, had 30% of the gene truncated during insertion, and produced a protein that was different than intended. Another corn variety Mon 863, had a mutated section.</p>
<p>The transgenes may also be unstable and rearrange over time, long after the crops have gone to market. Labs in France and Belgium analyzed the transgene sequence in 6 GM crops and found that in every case the sequence was different than that which was registered by the biotech company. In some cases, the sequence of the identical crop variety was different BETWEEN two labs, suggesting that the transgenes are not only unstable, but that they rearrange in a variety of ways. This means that they can be creating a range of untested, unintended proteins in our food supply.</p> <p>Even if the transgene gets properly inserted and is stable, the DNA can be read differently than what was intended, producing different or multiple proteins. It might also produce harmful RNA.</p>	

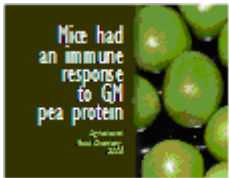


Suppose that the transgene sequence turns out to be identical to what you wanted, that it remains stable and that it produces the amino acid sequence of the protein that you intended. You still might have a problem. Proteins get folded, and the folding might be different in the new organism. A protein's shape can determine its effect and a

misfolded protein, or an aggregate of several misfolded proteins together, can be quite harmful. Prions are one form of a misfolded protein that is responsible for mad cow disease and the human variant, while amyloid fibrils are an example of aggregate proteins linked to a variety of medical conditions such as Alzheimer's and Parkinson's diseases.

Sometimes proteins are folded by elements called chaperon folders, which are other proteins that they have evolved with over thousands of years in the same plant as the proteins they fold. But with GM plants, you are putting a gene into a different plant, and its corresponding protein folders are not necessarily present. It is not certain that it will be folded correctly.

In addition to folding problems, proteins can get molecular attachments that can alter their function. For example: added sugar chains called glycosylation can turn a harmless protein into a deadly one because it can create allergic reactions. And this may be exactly what happened in GM peas.



In Australia, they took a gene from a kidney bean, which produced a certain pesticide, and inserted it into peas to kill the pea weevil.

These GM pea developers decided to do an allergic-type test on mice that no other GM food crop developer had done before. When they exposed mice to the proteins

from the kidney beans, it caused no reaction. They expected the same to happen when mice were exposed to the "same" protein produced by the transgene inside the peas. In fact, the amino acid sequence was identical in both proteins—the one produced by both the bean and the pea. But the mice developed an inflammatory response to the protein produced in the GM peas. It was an immune type response that was very dangerous, suggesting that the peas might create a deadly anaphylactic shock or other types of immune or inflammatory reactions in humans. They never marketed the GM peas.

But why did the mice react if the protein was the same as the natural protein found in kidney beans? They conducted an advanced test and looked very carefully at the protein structure and found that the sugars that had attached had a slightly changed pattern. They said it was the slightly changed pattern of the sugars that made the peas harmful.

The problem is that the potentially deadly GM peas had already passed all the allergy tests that are normally used to get GM foods on the market. The only reason they were stopped was because the Australian crop developer had chosen to use a mice study that had never been used on any other GM food crop. This shows that the regulatory system, as practiced, is a failure, and may be letting deadly allergens on the market. Ironically, when Monsanto's representative was asked about the cancellation of the peas (developed by another organization), he said that it proved that the regulatory system works. He never mentioned that none of his own company's products had ever used the same advanced mouse test, and that they may be creating allergic reactions.


[V. E. Prescott, et al, "Transgenic Expression of Bean r-Amylase Inhibitor in Peas Results in Altered Structure and Immunogenicity," *Journal of Agricultural Food Chemistry* (2005): 53.]





The fourth possible problem is that more herbicide residues will be present on herbicide tolerant crops. Also, the crop is designed to detoxify the herbicide, and the crop accumulates the new detoxified compound. These new compounds may be dangerous when consumed. (continued below)

For example, Liberty Link is a GM crop that is designed to detoxify Liberty herbicide, called gluphosinate ammonium. It turns the gluphosinate into a supposedly non-toxic alternative called NAG. NAG has never been part of our food supply, but the NAG is accumulated in the crop with every spray. When we eat the crop we eat the NAG.

When they took the pure NAG and fed it to mice or goats and looked in the feces, they found that curiously some of the NAG re-toxified back into gluphosinate. They believe that this re-toxification was caused by gut bacteria. That means when you eat Liberty Link corn, it is possible that some of its compounds convert back to herbicide within your intestines. It is probably not a lot of herbicide, but there are certain chemicals which become endocrine disrupters at very small doses. Sometimes they only act as endocrine disrupters in tiny concentrations--at parts per trillion or low parts per billion. Gluphosinate is known to damage fetal development in larger quantities, but it has not been tested in minute quantities, so we don't know if this conversion within our intestines would hurt consumers or developing fetuses.

	<p>When they fed Liberty Link corn to chickens, twice the number of chickens died. But, the test conducted by the industry was designed so poorly, even a doubling of the death rate was not statistically significant.</p> <p>[S. Leeson, "The Effect of Glufosinate Resistant Corn on Growth of Male Broiler Chickens," Department of Animal and Poultry Sciences, University of Guelph, Report No. A56379, July 12, 1996.]</p>
---	---

	<p>The fifth possible problem is that the transgene that was inserted into the crop might transfer into our gut bacteria or into our own cell's DNA.</p>
---	--


	<p>Normally, natural barriers prevent plant cells from transferring into bacterial cells, or prevent them from functioning in bacteria if they do transfer. The first requirement is similarity of sequence. To transfer into bacterial DNA, a gene should have a sequence that is very similar to bacterial DNA. But plant sequences are quite</p>
--	---

different. They are also longer. GM crops, however, have transgenes from bacteria inserted into their DNA. They are similar in sequence and length and may readily transfer to gut bacteria.

If natural plant genes were to transfer to bacteria, they probably wouldn't function for two reasons. First, embedded within plant genes are non-coding portions called introns. Although plants remove the introns before creating the RNA and proteins, bacteria would not likely know how to read the genes with introns. Second, plant promoters (or on-switches) do not generally work in bacteria. So the transferred gene would not likely be switched on inside bacteria. But GM transgenes have no embedded introns and they use a promoter that does work in bacteria.

Thus, while plant based foods do not likely end up contributing genes into our gut bacteria, GM crops might do so regularly, colonizing our very important gut flora. And if the transgene continued to function after transfer, it may produce GM proteins continuously inside of us. If these proteins confer a survival advantage to the bacteria, it would likely proliferate over the long term. So, we might have functioning transgenes living in the DNA of gut bacteria long after we stop eating GM foods.

Transgenes might also transfer into our own cells. In a German study, fragments of non-GM DNA fed to pregnant mice were found in the brain of the offspring. Other studies also found that some DNA from food does travel through the body and can end up in various organs.

	<p>The only human feeding study ever conducted on GM foods had 7 human volunteers with colostomy bags. They had their lower intestines removed. One of the things they were testing for was the biotech industry's claim that genes were destroyed during digestion. After feeding the volunteers GM soy burgers and GM soy milkshakes, they found a significant amount of GM soy transgenes in the colostomy (continue below)</p>
---	--

bags. The GM soy had survived passage through the stomach and lower intestine, overturning the myth that digestion of genes made gene transfer impossible.

More importantly, in the gut bacteria of 3 of the 7 volunteers, the transgene from soy was integrated into the DNA of their gut bacteria BEFORE they had the meal. This means that it was integrated from a previous meal. Thus, genes do transfer to gut bacteria and they continue to function. We don't know under what conditions transgenes transfer to gut bacteria and we don't know its medical implications or treatment.

[Netherwood et al, "Assessing the survival of transgenic plant DNA in the human gastrointestinal tract," *Nature Biotechnology* 22 (2004): 2.]

	<p>What can transfer? The promoter or "ON switch" might transfer. It can permanently turn on some random gene, forcing it to overproduce a protein around the clock. That protein may be an allergen, toxin, anti-nutrient, or carcinogen produced inside our gut bacteria or</p>
--	--

possibly from within our own cell's DNA. In the soy burger study mentioned earlier, the promoter transferred with the soy transgene, into human gut bacteria. If antibiotic resistant genes transfer, they might create super diseases, resistant to antibiotics. We know the roundup ready gene transfers from soybeans. There are virus resistant genes that could transfer from zucchini, papaya, and crookneck squash. Their viral proteins might suppress own body's viral defenses, or the proteins may be toxic. What if the Bt gene transfers? It could theoretically turn our intestinal flora into living pesticide factories, possibly for the long term. It is a good excuse to avoid eating GM corn chips, made from pesticide producing Bt corn.

	<p>To summarize the five possible problems we have presented, The DNA is disrupted, the protein you're intending to create might be a problem, the protein might be altered or function differently, there are higher herbicide residues, and GM genes might transfer.</p>
--	--

	<p>Let's look at a case study of Roundup Ready soy to see how this might have been affected by those five categories.</p>
--	---

	<p>First- When the transgene was inserted into the soy, a section of soy DNA next to the insertion site got scrambled and mutated. It does not resemble natural soy DNA anymore. They also found two extra transgene fragments that had been inserted, without Monsanto even knowing about it. Years after the soybeans were already on</p>
--	---


the market, an independent lab discovered the two transgene fragments. One was located next to the full length transgene.


[P. Windels, I. Taverniers, et al. "Characterisation of the Roundup Ready soybean insert," *Eur. Food Res. Technol.* 213 (2001): 107-112.]

	<p>The process of making the GM soy appears to have created some unpredicted changes in the composition of the soybean. GM soy has reduced proteins, reduced fatty acid, and a reduced essential amino acid. Also, reduced phytoestrogens that are believed to be good for fighting cancer</p>
--	--

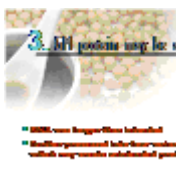
and heart disease. It has significantly higher levels of an anti-nutrient called soy lectin, which can block absorption of nutrients. There is an increase in a known soy allergen called trypsin inhibitor. In Monsanto's own study of cooked GM soy, there was as much as seven times more trypsin inhibitor compared to non-GMO soy. A seven fold increase of a known allergen! They left that information out of their study, but it was discovered later and made public. Lignin, the woody substance in many plants, was increased in GM soy. They found this because the stems of soybean plants were cracking in the heat. (citation below)

[See for example: Stephen R. Padgette et al, "The Composition of Glyphosate-Tolerant Soybean Seeds Is Equivalent to That of Conventional Soybeans," *The Journal of Nutrition* 126, no. 4, (April 1996); including data in the journal archives from the same study.]

 Lignin is produced in a plant from a complex interaction or so called "metabolic pathway." The same pathway also produces other substances, one of which, rotenone, is a plant pesticide that may lead to Parkinson's disease. If there is an increase in lignin there might be an increase in rotenone. All these are examples of the first category of problems: unpredicted changes in the DNA, which may create unpredicted changes in the nutrients, allergens, toxins, and anti-nutrients.


 Secondly, the protein itself may be harmful. In the amino acid sequence of the protein produced by the Roundup Ready transgene, a section is identical to a known dust mite allergen. The GM soy fails the WHO recommendations designed to keep allergenic GMOs off the market.

[G. A. Kleter and A. A. C. M. Peijnenburg, "Screening of transgenic proteins expressed in transgenic food crops for the presence of short amino acid sequences identical to potential, IgE-binding linear epitopes of allergens," *BMC Structural Biology* 2 (2002): 8–19.]

 Third, the GM protein may be altered. As mentioned earlier, the transgene first creates a strand of RNA, which then creates a protein. A European team of scientists decided to analyze the sequence of the RNA that is produced by the transgene inserted into GM soybeans. To their surprise, the RNA strand was much longer than it was supposed to be. The genetic stop


signal, which is inserted with the transgene to tell the cell "STOP READING, the gene ends here," did not work properly in the soybeans. It continued to read from DNA found beyond the transgene. Thus, the resulting RNA not only included the section coded by the inserted transgene, it also included sections coded by the extra transgene fragment that had been inserted into the soybeans, plus it included sections coded by DNA that had been scrambled or mutated during the gene insertion process. The RNA strand was further processed (chopped up and recombined) by the cell into four variations, each with a different sequence. Those RNA variations might create unintended proteins, which may of course be harmful. Furthermore, the stop signal used in GM soybeans is also used in most other GM foods on the market, which means that they also might be malfunctioning.

[Andreas Rang, et al, "Detection of RNA variants transcribed from the transgene in Roundup Ready soybean," *Eur Food Res Technol* 220 (2005): 438–443.]

 The fourth category is increased herbicide. Herbicide tolerant crops have more herbicide residues because the crop is sprayed directly with the herbicide. In addition, the over use of the herbicides on these GM crops has resulted in the creation of herbicide tolerant weeds. Farmers respond by increasing the dosage. During the first 9 years of these crops there was a 138 million pound increase in the

use of herbicide in the US, due to the GM crops alone. By 2004 it was estimated that GM Roundup Ready soy fields were getting about 86% more Roundup than the non-GM soy fields. The application of Roundup increases fusarium both on soy roots as well as in wheat. This creates micro toxins which may be dangerous for humans.

[Charles Benbrook, "Genetically Engineered Crops and Pesticide Use in the United States: The First Nine Years," *BioTech InfoNet*, Technical Paper Number 7, October 2004.]

 As the prevalence of herbicide tolerant weeds increases, the use of herbicide accelerates. While the increase in herbicide over the first 9 years was about 138 million pounds, over the next two years there was an estimated increase of another 120 million pounds. In a single year alone, the increase was 38%. The use of Roundup nearly doubled over the first decade of GM Roundup Ready crops. And because it is becoming less effective on herbicide tolerant weeds, farmers are now

using more toxic herbicides like 2,4-D, which is up 237% over two years.

[Communication with Charles Benbrook, based on USDA statistics.]

	<p>The last category is gene transfer. We know from the experiment described earlier that at least part of the soy gene did transfer to gut bacteria and continued to function.</p> <p>So, all of the five potential problems with GMOs that we discussed have been found in Roundup Ready soy.</p>
	<p>What do we know about GM soy's impact on health? Very little because there are so few studies. Here are some of the findings to date.</p>
	<p>We do know that soon after GM soy was introduced into the UK, soy allergies skyrocketed by 50%.</p> <p>[Reported in Mark Townsend, "Why soya is a hidden destroyer," <i>Daily Express</i>, March 12, 1999, but study not released to public]</p>
	<p>In a small study, one person had a skin prick reaction to GM soy, but not to non-GM soy. This test, which is used to indicate allergic reactions, suggests that GM soybeans have a different allergen profile than non-GM soy. The researchers then analyzed the GM soy and found a new unexpected protein (that likely resulted from the damage during the genetic engineering process). This protein was able to bind with IgE antibodies, suggesting that it may be a dangerous allergen.</p>
<p>[Hye-Yung Yum, Soo-Young Lee, Kyung-Eun Lee, Myung-Hyun Sohn, Kyu-Earn Kim, "Genetically Modified and Wild Soybeans: An immunologic comparison," <i>Allergy and Asthma Proceedings</i> 26, no. 3 (May–June 2005): 210-216(7).]</p>	
	<p>Mice fed GM soy for 8 months had a profound drop in the amount of digestive enzymes produced by their pancreas. If there were less protein digesting enzymes in the gut, then proteins from our foods may take longer to digest, leaving more time for an allergic reaction to take place. Thus, if GM soy interferes with human digestion like it apparently does with mice, it might increase allergies to proteins from many different foods, not just soybeans.</p>
<p>[Manuela Malatesta, et al, "Ultrastructural Analysis of Pancreatic Acinar Cells from Mice Fed on Genetically modified Soybean," <i>Journal of Anatomy</i> 201, no. 5 (November 2002): 409; and M. Malatesta, M. Biggiogera, E. Manuali, M. B. L. Rocchi, B. Baldelli, G. Gazzanelli, "Fine Structural Analyses of Pancreatic Acinar Cell Nuclei from Mice Fed on GM Soybean," <i>Eur J Histochem</i> 47 (2003): 385–388.]</p>	
	<p>Let's summarize the ways in which GM soy might increase allergies. The impaired digestion just mentioned might increase allergic response to many proteins. The new allergen created by the GM process might cause reactions. There is up to a sevenfold increase in the allergen trypsin inhibitor in cooked soy. GM soy has higher</p>
<p>levels of herbicide residues, which might also trigger reactions. The Roundup Ready protein has properties of a known allergen. In addition, since the soy transgene transfers to human gut bacteria and continues to produce this protein, it is possible that we have an allergen being continuously produced by our own intestinal flora.</p>	
	<p>Rabbits that were fed Roundup Ready soy had higher metabolic activity as well as changed enzyme levels in 3 main organs.</p> <p>[R. Tudisco, P. Lombardi, F. Bovera, D. d'Angelo, M. I. Cutrignelli, V. Mastellone, V. Terzi, L. Avallone, F. Infascelli, "Genetically Modified Soya Bean in Rabbit Feeding: Detection of DNA Fragments and Evaluation of Metabolic Effects by Enzymatic Analysis," <i>Animal Science</i> 82 (2006): 193–199.]</p>

	<p>Mice that were fed Roundup Ready soy for 8 months showed significant changes in the liver, which is a main detoxifier for the body. The liver cells were damaged or misshapen and there was altered gene expression. Higher metabolic activity also suggests that the liver was reacting to a toxic insult.</p>
<p>[M. Malatesta, C. Caporaloni, S. Gavaudan, M. B. Rocchi, S. Serafini, C. Tiberi, G. Gazzanelli, "Ultrastructural Morphometrical and Immunocytochemical Analyses of Hepatocyte Nuclei from Mice Fed on Genetically Modified Soyben," <i>Cell Struct Funct.</i> 27 (2002):173–180]</p>	
	<p>These photos show how the membrane surrounding the nuclei of liver cells was more irregular in the GM-fed mice on the right.</p>
	<p>Within the nuclei, the structure called the nucleoli was also misshapen in the GM-fed mice.</p>
	<p>Rats fed GM soy also showed changes in their livers, as seen in the photos on the right. [Irina Ermakova, "Experimental Evidence of GMO Hazards," Presentation at Scientists for a GM Free Europe, EU Parliament, Brussels, June 12, 2007]</p>
	<p>The testicles of mice fed GM soy had altered structures and function which influenced sperm development. This might influence fertility or offspring health [L. Vecchio et al, "Ultrastructural Analysis of Testes from Mice Fed on Genetically Modified Soybean," <i>European Journal of Histochemistry</i> 48, no. 4 (Oct–Dec 2004):449–454.]</p>
	<p>Rats fed GM soy showed changed color in their testicles, as well as changes in the cell structures. [Irina Ermakova, "Experimental Evidence of GMO Hazards," Presentation at Scientists for a GM Free Europe, EU Parliament, Brussels, June 12, 2007]</p>
	<p>Male and female mice were fed GM soy and then mated. The early stage embryos (4-8 cells) showed a temporary decrease in gene expression. This was not found in embryos whose parents ate natural non-GM soy. This could mean that the health of offspring may be adversely effected when parents consume GM soy.</p>
<p>[Oliveri et al., "Temporary Depression of Transcription in Mouse Pre-implantation Embryos from Mice Fed on Genetically Modified Soybean," <i>48th Symposium of the Society for Histochemistry, Lake Maggiore (Italy), September 7–10, 2006.</i>]</p>	
	<p>This appears to be the case in a study conducted by a senior scientist from the Russian National Academy of Sciences. She fed female rats GM soy, starting two weeks before they conceived, and continuing through pregnancy and lactation</p>
	<p>More than 50% of the offspring died within 3 weeks. Of the offspring whose mothers who ate non-GM soy, only 1 in 10 died within the same time period. [I.V.Ermakova, "Genetically Modified Organisms and Biological Risks," <i>Proceedings of International Disaster Reduction Conference (IDRC) Davos, Switzerland August 27th – September 1st, 2006: 168–172</i>; and Irina Ermakova, "Genetically modified soy leads to the decrease of weight and high mortality of rat pups of the first generation. Preliminary studies," <i>Ecosinform</i> 1 (2006): 4–9.]</p>
	<p>This is one day's death rate.</p>

	<p>The scientist pointed out that the offspring looked quite different when the mothers were fed GM soy. The photo on the upper right is the offspring from mothers fed natural soy. In the lower left is the GM group.</p>	
	<p>Among the differences was a dramatic reduction in average weight. Here's an example: The mother of the smaller rat ate GM soy.</p>	
	<p>In a small follow-up study, when they tried to mate the offspring from the GM group, they would not conceive.</p>	
	<p>The Russian rat study was small and preliminary. We cannot say conclusively that a Roundup Ready soy diet will cause damage to offspring. In fact, the study had some problems because they never did a biochemical analysis of the feed, which might have had additional toxic contaminants that was the cause of the damage to the offspring. The scientist repeated the study three times and got similar results.</p>	
<p>Then unexpectedly, the rat chow that they were using at the facility was changed by the supplier and became GM soy-based. The scientist could not do any more GM soy studies, as there were no controls. All the rats housed at the facility were eating GM soy. Two months later, she asked her colleagues, "what's the mortality rate among the rats you are working with?" it was now over 55%. This finding supports the notion that it was not toxins in the particular batch used in the GM soy experiments. Rather GM soy in general appears to create this effect in newborn rats.</p> <p>[I.V.Ermakova "GMO: Life itself intervened into the experiments," Letter, <i>EcosInform</i> N2 (2006): 3–4.]</p>		
	<p>If GM crops are so bad, why don't we see more problems?</p>	
	<p>One reason is illustrated by the story of L-tryptophan, a food supplement sold in the US in the 1980s. There were 6 companies that were exporting L-tryptophan from Japan to the US. One company Showa Denko, was the only one that was genetically engineering the bacteria for the production of the product. That almost certainly</p>	
<p>created the contaminants within L-tryptophan which was responsible for this deadly epidemic. It killed about 100 Americans and caused another 5-10,000 to fall sick or become permanently disabled.</p>		
	<p>It took years to discover that the epidemic was underway. It required a series of coincidences, plus the fact that the disease had three concurrent characteristics. The disease:</p> <p>Was new with unique symptoms that stood out, It was acute so people went to doctors or hospitals, It came on quickly, so they went to doctors right after taking it,</p>	
<p>Imagine if one of these three characteristics was not present. What if it created common diseases such as cancer, heart disease, diabetes, or obesity. It would likely have remained undiscovered and would still be on the market. Similarly, if it created symptoms that weren't so serious or if symptoms didn't come on quickly, it might never have been traced to L-tryptophan.</p> <p>We don't know if GM foods, which were widely introduced in late 1996, contributed to the fact that food-related illnesses in the US doubled between 1994 and 2001. We don't know if it's related to the increase in allergies, asthma, migraines, ADD, or diabetes.</p>		

	<p>We don't know because there is no post-marketing surveillance No human clinical trials No proper evaluation of plant changes or effects And government approvals are based on disproved or untested assumptions, or industry studies, which are widely criticized as rigged to avoid finding problems.</p>
	<p>Now rate yourself again. From 1-100, How vigilant to avoid GM food when eating out? <i>After each question, ask how many people are between 1-20, 20-40, 40-60, 60-80, 80-100.</i></p> <p>How vigilant will you be to avoid bringing GM food home? How active do you plan to be helping to stop this?</p>
	<p>Although genetically modified organisms (GMOs) are one of the most dangerous health and environmental risks we face, they are also one of the easiest of our major problems to solve. Unlike trans fats or sugar, GMOs don't offer any perceived consumer benefits. Furthermore, when consumers realize the health risks, they are highly motivated to choose brands without GMOs. Just a small percentage of the population switching to non-GMO brands will create a tipping point, forcing major food companies to quickly replace GM ingredients.</p>
	<p>When the tipping point of consumer rejection was reached in Europe in 1999, <i>within a single week, virtually all major food companies committed to remove GMOs.</i></p>
	<p>The European tipping point was achieved within 10 weeks of the lifting of Dr. Pusztai's gag order. More than 750 articles were written, which propelled the issue into the mainstream awareness. People were concerned about the health effects, and using GM ingredients became a liability.</p>
	<p>The rejection in Europe has contained the expansion of GMOs. Whereas the biotech industry was literally targeting a conversion of all commercial seeds in the world to become genetically engineered, it has been limited to 4 major crops with 2 major traits, produced in 6 countries on a total of 2.4% of the world's agricultural land.</p>
	<p>Unfortunately, the US sugar beet farmers have introduced GM sugar. They planted it widely in 2008, which means that sugar will be genetically engineered by the end of the year. Please go to www.DontPlantGMOBeets.org and write a letter that will be sent to 63 companies, asking them not to use GM sugar. With a large enough response, the companies can contain this and convince the growers to abandon GM seeds for next year.</p>
	<p>Unlike in Europe, the mainstream press has not covered the GM issue in the US. Thus, if you ask the average American "have you ever eaten genetically modified foods?," 60% say no, 15% say I don't know. The success of the GM food industry in the US is based on consumer ignorance.</p>

 <p>Tipping point for US rejection of GM crops</p>	<p>The number of people needed in the US to create a European-style tipping point is probably very low. If even 5 percent of the U.S. population rejected GM brands, it should be more than enough to reach this Tipping Point, since that represents an enormous loss in revenue for food companies. Whatever the magic percentage is, there are certainly far more people in the US who would buy non-GMO products if given a choice. In fact, a 2008 survey by CBS and the <i>New York Times</i> showed that 53 percent of Americans would avoid GMOs if they were labeled.</p>
 <p>Campaign for Healthier Eating in America</p>	<p>The Institute for Responsible Technology and a coalition of organizations launched the Campaign for Healthier Eating in America, which is designed to hit the US tipping point by the end of 2009. They are bringing the message that “Healthy eating starts with no GMOs” and providing clear non-GMO choices through a Non-GMO Shopping Guide (Fall, 2008).</p>
 <p>General population</p>	<p>If the mainstream media were to cover this issue adequately, we would see a rejection of GMOs by the whole population. But we don’t need to rely on them. There are specific groups that are receptive to the information about the health risks of GMOs, and would welcome the opportunity to buy healthier non-GM brands.</p>
 <p>School meals</p>	<p>Kids are most at risk from the potential dangers of GM foods, and parents and schools are already looking for ways to make kids’ meals healthier. The Campaign for Healthier Eating in America includes a GM-Free School Campaign.</p>
 <p>Health professionals</p>	<p>Many healthcare professionals are becoming aware of the dangers of GMOs and are prescribing non-GMO diets to their patients. Allergist Dr. John Boyles says, “I used to test for soy allergies all the time, but now that soy is genetically engineered, it is so dangerous that I tell people never to eat it—unless it says organic.” The Campaign will distribute patient education material through practitioners.</p>
 <p>Religious groups</p>	<p>Many religious groups have taken a strong stand against GM foods. Now they can also distribute information on the health dangers, and give their members the Non-GMO Shopping Guide.</p>
 <p>Fiscally conscious shoppers</p>	<p>Health-conscious shoppers alone could easily achieve the tipping point. There are 28 million regular organic buyers in the U.S. and another 54 million casual organic buyers. The Campaign is helping to inspire the entire natural food industry to remove all remaining GM ingredients from their brands. It will distribute a free Non-GMO Shopping Guide through natural food stores, and install in-store Non-GMO education centers. The Shopping Guide and educational materials will also be distributed through organizations, magazines and websites.</p>
 <p>Tipping point against rBGH or rBST</p>	<p>We are already seeing a tipping point against Monsanto’s genetically engineered bovine growth hormone, called rBGH or rBST. In 2006, newspapers called it a tipping point or explosion in the industry. Since then, Wal-Mart, Kroger, Starbucks, and about 40 of the top 100 dairies so far have removed it from their milk or dairy products. We see the same thing happening soon with GM ingredients across the board.</p>



DVDs, CDs, books, e-books, brochures, e-newsletters are available to help spread the word at

<http://www.responsibletechnology.org>



Once again, here are the tips to help you avoid eating GMOs.